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# **EDUSCAPE: THE EFFECTS OF SERVICESCAPES AND EMOTIONS IN ACADEMIC LEARNING ENVIRONMENTS**

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# **EDUSCAPE: THE EFFECTS OF SERVICESCAPES AND EMOTIONS IN ACADEMIC LEARNING ENVIRONMENTS**

## **Abstract**

Conceptual and empirical studies on the impact of physical environments in educational settings are lacking. In comparison, consumption environments research has a rich history. In this paper we bring together these two research streams to develop (Study One) and test (Study Two) an 'Eduscape' model of the effects of emotions and servicescape factors in higher education settings. Study One (423 students), explores aspects of the physical environment. Building on Study One, Study Two uses structural equation modelling (209 students) to test the proposed conceptual model. The results highlight that comfort, temperature/humidity, functionality/design, acoustics/visual features are key in determining the pleasure of students within the environment. Although Study One highlights that cleanliness/upkeep is important to students, Study Two does not find statistical support for this association. The proposed model also emphasizes the links between students' pleasure derived from the environment and their satisfaction, engagement/involvement and approach behaviour.

## **Keywords:**

Eduscape, Servicescape, Physical Environment, Higher Education, Marketing

## **Introduction**

Moving from an elite to mass system, during the past 10 years, higher education has faced a competitive marketplace where tuition fees and global league tables have resulted in a shift where students have been viewed as interchangeably as; consumers (Hunt-Grubbe 2010), informed consumers of received knowledge (Bedeian 2004), junior partners (Ferris 2002) and professional services clients (Armstrong 2003). Consequently students' demands on learning environments have changed, demanding more convenience, interaction and better amenities (Coffey and Wood-Steed 2001). Prospective students are also increasingly viewed as market segments to be served by the various programs on offer (Armstrong 2003). In addition, recent research finds that the quality of facilities at UK universities plays a significant role in which establishment students choose to study (Sellgren 2014). One way, in which many universities have responded, is through engaging more heavily in marketing strategy, the so-called 'marketization' of higher education (Lowrie and Helmsley-Brown 2011). This increased focus has encouraged the adoption of many practices associated with private enterprises (Newman and Jahdi 2009) (see also De Vita and Case 2003 for a critique of marketization within the international context). As Ford and Bowen (2008) note, within services marketing the physical environment in which the service is provided communicates safety, quality and value of the service itself and in response to this element of marketing many universities and business schools have engaged in extensive building projects (Newman and Jahdi 2009). However, while there has been brief academic mention in this area (Newman and Jahdi 2009), Temple (2007) notes that detailed reflections on teaching spaces is largely absent in the higher education literature highlighting a need for empirically and theoretically grounded studies in the area.

Extensive studies in retail and service settings have long recognised the physical environment as an effective marketing tool for consumers (Donovan et al 1994; Bitner 1992;

Turley and Milliman 2000) and employees (Elsbach and Pratt, 2007). Yet, higher education establishments have focused on the traditional marketing mix (promotion, price, product and place) at the expense of aspects of the extended services marketing mix which encompasses the focus of this paper, the physical environment.

The two studies reported in this paper are designed to contribute in several ways. First, an objective of the research is to synthesise literature on learning and consumption environments and apply this to higher education environments. Driven by this synthesis and the exploratory results of Study One, a second objective is to build a conceptual model of higher education environments termed 'Eduscape'. Consequently, distinct from studies that examine individual internal environmental factors, the current study addresses an important research gap because it forwards the first holistic conceptualisation of higher education environments. Therefore, a contribution of the research lies in the study's synthesis and application of literature from both education and marketing to the context of higher education. Third, an objective of this study is to test the Eduscape model providing empirically grounded insights into the proposed dynamics. Thus, the study contributes to existing research via the simultaneous estimation of the Eduscape constructs. In doing so, the study offers rich insights and deepens understanding of the factors associated with higher education environments and students' behaviour within them.

## **Background**

Environmental psychology, the study of 'the relationships between.....behavior and experience and the built and natural environment' (Bell et al 2001, 6) offers insight into physical environments and has been utilised in both retail and educational settings.

### ***Retail Environment Research***

Retail environmental research has employed a range of terminologies to describe and analyse the impact of the environment on consumers' decisions including atmospherics (Kotler 1973) shelf-space studies and servicescape. The majority of these studies found their theoretical approach on the stimulus-organism-response (S-O-R) paradigm where atmosphere/ambient factors (the main features of atmospherics research) represent the stimuli (S) that causes consumers evaluation, emotion or attitude (O) and causes some behavioural response (R) (Tai and Fung 1991). In turn these studies draw on the work of researchers Mehrabian and Russell (1974), within whose framework, ambient factors are argued to result in a mixture of three emotional responses, Pleasure, Arousal and Dominance (PAD) which are, in turn, expected to affect consumer response behaviour resulting in two consumers behaviours, approach and avoidance. Pleasure is the degree to which the person feels good, happy or satisfied in the situation. Arousal represents the degree that a person feels excited, stimulated or active in a situation. Dominance denotes the extent to which the individual feels in control, or free to act in, the situation. Approach is the desire to stay, work and affiliate in the setting. Avoidance is characterised as the opposite - a desire not to stay, work, and affiliate (Mehrabian and Russell 1974). The authors suggest that pleasurable environments usually result in approach behaviour, unpleasant environments the opposite. Arousal is a more complex issue as some individuals prefer arousing environments, others not, and levels of arousal required may differ for the tasks at hand. For example, nightclub patrons seek more arousing environments compared with those who frequent museums. Multiple studies have applied the Mehrabian and Russell framework to consumer behaviour including studies in retail settings (Donovan et al 1994), shopping centres (Raajpoot et al 2008), banking (Massara et al 2010), outdoor markets (Ridgway et al 1990), restaurants (Jang and Namkung 2009) and online purchasing (Kim and Lennon 2010).

Building on and including the PAD dimensions and approach and avoidance, in 1992,

Bitner developed an integrative theoretical framework termed 'servicescape'. Focusing on service environments, the servicescape framework emphasises the impact of the physical environment on the behaviours of both customers and employees and also adds cognitive and physiological internal responses to the emotional outcomes central in earlier studies.

Bitner advocates that consumers respond holistically to settings and states 'although individuals perceive discrete stimuli, it is the total configuration of the stimuli that determines their responses to the environment' (1992, 65). The servicescape framework has been used extensively to study a range of environments including retail settings (O'Cass and Grace 2008), leisure settings (Wakefield and Blodgett 1996), online settings (Williams and Dargel 2004), public houses (Schmidt and Sapsford 1995), tourism (Cunnell and Prentice 2000, Lucas 2003) and restaurants (Ryu and Jang 2008).

### ***Educational Environmental Research***

Typically, work in this area has either noted the importance of the learning space for facilitation of the learning experience generally (Rowley 2002; Kolb and Kolb 2005) or has explored individual ambient factors in isolation (see Ezeh and Harris 2007) on specific aspects of educational achievement. This is to the detriment of studies that utilise a holistic approach as is advocated by Bitner. The majority of education-based studies also concern themselves with school, rather than higher education environments.

Single-focus studies have independently concentrated on the three areas of general maintenance, lighting and comfort. Focusing on general maintenance, studies have highlighted the physical/logistical effects (slowing or impeding teaching) and cognitive (motivating and inspiring) effects of poor building condition on attendance, behaviour and academic achievement (Rutter 1979; CABE 2005; Durán-Narucki 2008). Additionally, Temple (2007) argues that the accumulated and social effects of maintenance are important and that the demoralizing effects of deteriorated school buildings may convey messages of

unworthiness and abandonment to students, parents and teachers.

The effects of lighting have been studied within learning settings (Winterbottom and Wilkins 2009) and other built environments (Bechtel 1997). Lighting studies have highlighted discomfort (e.g. glare from screens, too bright a light), headaches caused by flicker from florescent classroom lighting and impaired task and visual performance as potential negative effects from lighting (Winterbottom and Wilkins 2009). Potential positive effects from lighting include relaxation and interest in subjects and a link between attainment and good lighting (Winterbottom and Wilkins 2009).

Comfort has also received limited attention with studies noting the potential inflexibility of seating affecting learning within the space (Rowley 2002), ergonomic studies investigating seating design and levels of comfort for students (Li et al 2010) and offices (Groenesteijn et al 2009).

To summarise, although individual environmental aspects have received limited attention, a review of existing literature reveals no single or specific factors within teaching environments that appears most important to our understanding of students' emotive, cognitive and behavioural responses. Given this identified dearth in the literature, Study One outlined below, builds on extant research to explore students' perceptions of the teaching environment and the effect of the environment on students' ability to learn. This in turn contributes the base for the development of a conceptual Eduscape model of higher education environments.

## **Study One**

Given the current lack of research on the effect of environmental facets on university higher education students, Study One sought to explore (a) which aspects of the environment were



perceived as most important, (b) students' overall impression of learning environments and (c) how the environments enabled them to learn. A survey approach was used, including both quantitative (closed) and qualitative (open-ended) questions, thus enabling students to make further comment. Extant literature was employed to source suitable qualitative and quantitative items. Classifications of atmospheric/servicescape variables offered by Bitner (1992) and Turley and Milliman (2000) provided guidance while measures relating to furnishings and cleanliness were adapted from Harris and Ezeh (2008). Items relating to general condition and design were adapted from Raajpoot et al (2008). Items reflecting layout and design factors were garnered from Reynolds and Harris (2008). Questions were asked in 3 sections (Physical Quality of the Learning Environment, Your Overall Impression of the Learning Environment, Learning in this Environment). The statements used for each section are included in Appendix A. For each section a space was left for comments, for respondents to either explain their answers to the closed questions or to expand further. The students were also asked what they would change in the lecture theatre(s) to make it more conducive to their learning. Their age and gender was also recorded. Questionnaires were handed to business school students in situ in a university and were asked to consider both the room in which they were currently being taught and other rooms in which they were regularly taught. During data collection, students were asked to comment on four separate lecture theatres (see Table One). Hence the sampling was purposeful to allow comparisons between different types of cases (Teddlie and Yu 2007) and used a maximum variation approach (Onwuegbuzie and Collins 2007). A maximum variation sampling approach chooses "settings, groups and/or individuals to maximise the range of perspectives investigated in the study" (pp 285). The data collected underwent exploratory descriptive data analysis, using SPSS and qualitative data analysis using NVIVO.

[Insert Table 1 here]

In total 423 questionnaires were completed from across three student groups (144 MBA students, 204 first-year undergraduate Marketing students, 75 second year undergraduate Business Management students). Respondents ranged from 18 to 37 years, 47% of the respondents were female, 53% were male. Comments were subjected to thematic analysis (Braun and Clarke, 2006) and were repeatedly analysed until patterns and classifications within the findings occurred that adequately reflected the data (Edvardsson, 1992). Data collection and analysis stopped at the point of theoretical saturation, the stage at which no new categories of incidence or comments are divulged (Strauss and Corbin, 1998). The main themes particularly commented on by students<sup>1</sup> are discussed below and supported by quantitative results in that area.

Overall, students felt that the lecture theatres in which they were taught were of a comfortable temperature and humidity (61% and 60.2% respectively answered agree/strongly agree). However, a number of students also complained that rooms were too hot and stuffy, while others thought that the rooms were too cold, suggesting that the optimum temperature may be subjective.

Reports of the general cleanliness/upkeep of the lecture theatres differed across the different lecture theatres. Those responding in the newer lecture theatre 1 stated that they would not change anything and also gave some positive comments: 'LOVE IT (female, 18)'. The more negative comments, which largely centered on the older lecture theatres concentrated on the need for a makeover or modernisation to 'liven up', through to stronger comments such as: 'I would bulldoze it. Knock it down! (male, 19)'. This was supported by the quantitative findings. In lecture theatre 1, 90.1% of students agreed/strongly agreed that the room was clean and well looked after. This dropped to 70.6% for lecture theatre 4, 48.3% for lecture theatre 2 and 32.5% for lecture theatre 3. These findings suggest that room

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<sup>1</sup> All student comments are presented as written by students- grammar and spelling mistakes etc are retained.

cleanliness and upkeep is important to students and that this is potentially linked to the age of the room.

A number of students commented on issues relating to design and comfort. When asked what they would improve, the majority of comments were negative asking for better comfort, colour and seating size. Remarks included: 'The seats are too low and I have not enough space for my legs which is very uncomfortable (male, 20)', 'There isn't enough writing area, the desks/bench is too thin (female, 22)'. Students also noted the effects of comfort on their ability to concentrate: 'It's difficult to concentrate when you're uncomfortable [lecture theatre 3]'. Concurrent with comments relating to cleanliness, the quantitative findings suggested comfort differed across lecture theatres, with 92.1% of students agreed/strongly agreed that the room was comfortable for lecture theatre 1, dropping to 74% for lecture theatre 4, 21.6% for lecture theatre 2 and 20.3% for lecture theatre 3.

Students also reported issues that related to their ability to hear and see within the lecture theatres. Specifically, lighting received a number of comments. The quantitative findings show that the majority of students agreed/strongly agreed that the rooms were adequately lit (62.3%), but 58.2% stated they would prefer natural light although this differed between lecture theatres. In their comments students requested more and better lighting reporting lighting conditions as dull. Comments suggested the effect of poor lighting on the students' ability to learn: 'I dislike artificial light-makes me tired and miserable (male, 19)'. Two other factors appeared to affect students ability to work with students commenting on acoustics: 'Listening in the back few seats could be a bit difficult (female, 18)' and odours: '...sometimes air being circulated smells of fumes (female, 19)'.

To summarise, the results of Study One highlight that that temperature and humidity, comfort, cleanliness and upkeep, comfort, functionality and design, and acoustics and visual features are of primary importance to students.

## **Study Two: An Eduscape model**

As noted above, past research on the impact of physical environments within education settings has focused almost exclusively on a small number of individual environmental factors. This has been to the detriment of a broader understanding of the environmental factors that affect higher education students. To contribute to this identified gap, Study One provides evidence that numerous dimensions are important to our understanding of students' emotions and behaviours within higher education settings. Consequently, the need to conceptualize and empirically study the effects of a broader configuration of relevant environmental stimuli on higher education student's emotions, cognitions and behaviours is needed.

As a result in Study Two we seek to forward and assess a framework termed 'Eduscape', derived from extant literature, and the results of Study One (see Figure One). While Study One highlights the importance of a number of environmental factors, a useful framework is needed to examine the simultaneous impact of these environmental factors on students' emotive and behaviours outcomes. As noted previously much research in environmental psychology utilizes the S-O-R framework and we also propose this framework for the Eduscape model. As can be seen in Figure One, it is suggested that the environmental factors form the stimuli and will be discussed further below. Based on existing literature and the results of Study One, we forward pleasure (one of the three elements of Mehrabian and Russell's Pleasure, Arousal and Dominance (PAD) framework) as an internal organism

response. Students within Study One reported higher levels of pleasure (in response to the statement ‘The room is a pleasurable place in which to learn’) when students were also satisfied with various ambient factors (temperature ( $r = .523$ ), ventilation ( $r = .668$ ), humidity ( $r = .608$ ), lighting ( $r = .643$ ) (all  $ps < .01$ )). Finally three response variables (approach, satisfaction and involvement) are hypothesised and are discussed further below.

[Insert Figure 1 here]

### ***Hypotheses Development: Environmental Factors and Pleasure***

Based on a review of the literature and the results of Study One, five independent environmental stimuli variables are identified whose relationship with our dependent variables is mediated by the affective construct pleasure. Mehrabian and Russell suggested a range of differing levels of pleasure dependent on the specific type of educational environment<sup>2</sup>, with cosy or private educational settings demonstrating higher levels of pleasure. How these emotional responses are linked to the ambient factors is of vital importance. Yet, in both retail and educational settings little work has looked at the specific links between ambient factors and emotions. However, it is evident that students who report being comfortable or happy with the dimensions of their environment will display higher levels of pleasure.

Firstly comfort has been shown to be important to students in Study One affecting their experience in the learning environment. Comfort has also been highlighted as an important variable in servicescape research exploring leisure settings (Wakefield and Blodgett 1996), casinos (Lam et al 2011) and restaurants (Kim and Moon 2009)

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<sup>2</sup> Three examples of educational settings that Mehrabian and Russell; (1974, Appendix A) tested: (1) sitting in a library cubicle (pleasure -0.32, arousal -1.22, dominance-.021), (2) studying in a familiar and cosy place (pleasure +0.34, arousal -0.95, dominance -0.17), (3) studying in your own barren office (pleasure -1.11, arousal -0.77, dominance +0.06). (A numerical scale of +4 to -4 is used for each dimension (e.g. +4 is assigned for extremely happy and -4 for extremely unhappy). Subjects responses are averaged across the six dimensions of each of the three factors).

demonstrating a positive relationship with behavioural intention, satisfaction, pleasure and repatronage.

Secondly, students noted temperature as important in Study One. Interestingly, a number of studies draw a link between temperature and aggression within commercial settings with the suggestion that hot temperatures increase upset feelings, decrease comfort and heighten feelings of distress as well as impairing performance on some cognition-based tasks, including visual and auditory vigilance tasks, arithmetic tasks and short-term memory tasks (Anderson and Anderson 1998). However, Study One suggested that temperature was important in terms of individual comfort, rather than being too high or too low. This is supported by Lam et al (2011) who note that in the case of casinos gamblers will feel physically uncomfortable if the servicescape is too cold or too hot, and the air quality is poor.

Thirdly, work on servicescapes highlights the importance of functionality and design generally (Bitner 1992), in restaurants (Harris and Eze 2008) and with regards corporate image (Nguyen and Leblanc 2002). Students' ability to hear and see what is happening within the lecture theatre was noted as important by a number of students within Study One. Acoustic issues have been studied within servicescape research broadly with links to satisfaction within healthcare settings (Lee 2011) and appropriateness of noise and effects on pleasure, arousal and behavioural intent within restaurant settings (Novak et al 2010).

Finally, as noted prior research highlights the potential negative effects of poor building quality and cleanliness. This concurs with Study One where students commented significantly on the condition of the lecture theatres. Studies more widely in terms of servicescape have demonstrated the importance of a clean environment (Wakefield and Blodgett 1996; Harris and Eze 2008) and a positive relationship between the cleanliness of a servicescape and feelings of pleasure (Vilnai-Yavetz and Gilboa 2010). Thus:

- H<sub>1</sub>: *The greater the perceived level of comfort, the greater is the pleasure experienced.*
- H<sub>2</sub>: *The greater the level of comfort with ambient temperature and humidity, the greater is the pleasure experienced.*
- H<sub>3</sub>: *The greater the perceived functionality of the lecture room design, the greater is the pleasure experienced.*
- H<sub>4</sub>: *The greater the quality of the audio and visual features of the lecture theatre, the greater is the pleasure experienced.*
- H<sub>5</sub>: *The greater the perceived cleanliness and upkeep of the lecture theatre, the greater is the pleasure experienced.*

#### ***Hypotheses Development: Response Variables***

Outcomes relating to the pleasure experienced by students form the final three hypotheses of Study Two. The response of students to physical learning environments is of vital importance. While achievement (grades) is used within the schools literature (see for example Durán-Narucki 2008) this is a difficult objective within university higher education research (Temple 2007) as it is unlikely that any one university higher education educational setting (e.g., a lecture room) may have a large single effect on grades. Hence other features of a student's behaviour may be more suitable for responses are discussed below.

In line with the works of Mehrabian and Russell and Bitner, Approach-Avoidance is the first hypothesised outcome variable. Approach-Avoidance is deemed to have four aspects, the fourth of which 'the degree of enhancement (approach) or hindrance (avoidance) of performance and satisfaction with task performances' is the most relevant for educational settings. However, in educational settings it may also be less about performance and more about ability to learn as noted in Study One. The link between emotions and approach-

avoidance has been studied a number of times within the retailing literature. In general studies show higher levels of pleasure are linked directly with an increase in approach behaviour (Donovan et al 1994, Jang and Namkung 2009). Thus:

H<sub>6</sub>: *The greater the experienced pleasure, the greater the enhancement (approach) of performance and satisfaction with task performances within the environment*

The second response variable hypothesised relates to satisfaction. Wiers-Jenssen, et al (2002) deconstruct the concept of satisfaction in educational environments into eight different areas including quality of teaching, quality of physical infrastructure etc. CABA (2005) suggests that in addition to the general importance of satisfaction for students that 'the way people feel and behave while studying or working within buildings is linked to their overall satisfaction rates and levels of happiness (8)'. In other markets, such as dentistry, the link between satisfaction and servicescape factors has also been found (Andrus 1986). Arambewela and Hall (2011) also found a significant link between the internal and external environment and the satisfaction of students. Temple (1997), does however, note indecision in the literature about the linkage between physical features and satisfaction. He suggests that the effects are often indirect supported here by the linkage via emotional responses to overcome this problem. A number of studies have directly linked PAD dimensions to satisfaction. Ridgeway, Dawson and Bloch (1989) found that increased pleasure was associated with increased satisfaction. Machleit and Mantel (2001) suggested more broadly that positive pleasure, arousal and dominance would result in increased satisfaction. Thus:

H<sub>7</sub>: *The greater the experienced pleasure, the greater is level of satisfaction.*

The third hypothesised outcome termed academic engagement/involvement, has been previously studied in schools (Greenwood, et al 2002), universities (Astin 1984, Hu and Kuh 2002, Richardson et al 2003) and workplaces (Noe et al 2010). Owing to the wide focus of



study, there is no one agreed definition of academic engagement. Rather, a number of authors (Marks 2000, Hu and Kuh 2002, Richardson et al 2003) propose aligned definitions including ‘the quality of effort students themselves devote to educationally purposeful activities that contribute directly to desired outcomes’ (Hu and Kuh 2002, 555). Academic engagement has been linked to and is a strong predictor of student development (Astin 1984), academic achievement (Greenwood, Horton and Utley 2002, Klem and Connell 2004), retention and dropout (Astin 1984), satisfaction (Richardson, Long and Woodley 2003), good attendance (NCSE 2006) and grades (e.g. Durán-Narucki 2008).

Engagement is often viewed as overlapping the construct of involvement (Glanville and Wildhagen 2007), which Astin (1984) defines as ‘the amount of physical and psychological energy that the student devotes to the academic experience’ (518). Involvement, rather than engagement, is widely researched within both social psychology and consumer behaviour (Zaichkowsky 1994) where shorter measures map extremely well against academic engagement measures. While there is no current published work that directly links academic engagement/involvement to the PAD dimensions a number of studies have explored the effect of the PAD dimensions on desire to affiliate (Dubé et al 1995), increased explorative behaviour (Ridgeway et al 1989) and allocation of effort (Tai and Fung 1997) all suggesting that higher levels of positive emotions increase these behaviours and thus it would be expected that higher levels of/more positive emotions would increase engagement/involvement:

H<sub>8</sub>: *The greater the experienced pleasure, the greater is the level of student engagement/involvement.*

## Method

Given the composition of our research model, a survey-based approach was deemed most appropriate. A total of 213 business school postgraduate and undergraduate students were recruited at a university (209 questionnaires were usable). As in study one the sampling was purposeful and followed a maximum variation approach (Onwuegbuzie and Collins 2007). Students were asked to participate during class time and to answer the questionnaire reflecting on the teaching environment that they were currently in. A total of 2 rooms were sampled (see Table Two). Students took an average of 10 minutes to complete the questionnaire and 51% of the respondents were female. To encourage student participation students were offered a financial incentive to complete the questionnaire (entered into a draw to win £150). The measures utilised 7-point likert-type scales and were derived from existing studies. Scales for comfort, temperature and humidity, functionality of design, audio and visual features and cleanliness and upkeep were taken and adapted from Rajpoot et al (2008) Harris and Ezeh (2008) and Lewis, James and Reynolds (2007). Pleasure was assessed using Mehrabian and Russell's (1974) scales, while approach/avoidance was assessed using Donovan and Rossiter's (1982) measure. Satisfaction was measured using scales from Wiers-Jenssen et al (2002) and engagement/involvement was measured using the Personal Involvement Inventory (PII) (Zaichkowsky 1994). See Appendix B for full detail on each of the scales/measures used in Study Two.

[Insert Table 2 here]

## *Scale Assessment*

Following exploratory factor analysis, we used confirmatory factor analysis (CFA) to assess our measurement model. Analysis of the fit indexes suggest satisfactory model fit ( $\chi^2/\text{d.f.} = 1.70$ , comparative fit index [CFI] = .93, non-normed fit index [NNFI] = .94, and root mean

square error of approximation [RMSEA] = .06). Our results also indicate that our measures possess good psychometric properties. All loadings and corresponding t-values were statistically significant ( $p = 0.05$ ) indicating convergent validity. Values relating to each measure's Cronbach alpha, composite reliability and average variance extracted (AVE) all exceeded standard thresholds. Following recommendations outlined by Fornell and Larcker (1981) the AVE score for each construct was used to demonstrate measure discriminant validity.

### ***Structural Model***

The results of our structural model are presented in Table Three. Analysing our data using structural equation modelling allowed us to assess each of the eight proposed hypotheses simultaneously. The goodness of fit indices suggest that our research model represents a good fit with the data ( $\chi^2/\text{d.f.} = 2.00$ , CFI = .93, NNFI = .93, and RMSEA = .06). Statistical support is found for seven of our eight forwarded hypotheses. First, statistical support for H<sub>1</sub> ( $\beta = .35$ ,  $t = 2.50$ ,  $p < .05$ ) suggests that the more comfortable a student finds a lecture theatre environment the more pleasure they experience during their time within the environment. Statistical support for H<sub>2</sub> ( $\beta = .20$ ,  $t = 2.01$ ,  $p < .05$ ) suggests that the more comfortable the temperature and humidity, the more pleasure students experience during their lectures. We also find support for H<sub>3</sub> ( $\beta = .19$ ,  $t = 2.12$ ,  $p < .05$ ) which posits, a relationship between lecture theatre design and functionality and students pleasure. Specifically, as perceptions of functionality increase so does pleasure. Statistical support is also uncovered for H<sub>4</sub> ( $\beta = .23$ ,  $t = 2.93$ ,  $p < .05$ ) suggesting that quality of acoustics and visibility in a lecture theatre positively relate to student pleasure.

Interestingly, our results do not provide statistical support for H<sub>5</sub> ( $\beta = .11$ ,  $t = 1.31$ ,  $p > .05$ ) indicating that good levels of lecture theatre cleanliness and upkeep do not directly impact student pleasure as expected. We speculate that this may be because unlike school environments

where students spend full days within the same learning environments our students spend less time overall in the individual environments tested and are exposed to a wider range of learning environments. The results of our structural equation model suggest that pleasure has a positive and statistically significant impact on all three of our dependent variables; approach ( $H_6 \beta = .64$ ,  $t = 6.45$ ,  $p < .001$ ), satisfaction ( $H_7 \beta = .53$ ,  $t = 5.47$ ,  $p < .001$ ), and involvement ( $H_6 \beta = .45$ ,  $t = 4.25$ ,  $p < .001$ ).

[Insert Table 3 here]

## **Discussion and Conclusions**

This research proposes and tests a theoretical framework termed Eduscape with the aim of guiding future research in higher education learning environments. First, extant literature on learning and consumption environments is reviewed. Together with insights derived from Study One, we forward a formal research framework we term ‘Eduscape’. In adopting a holistic perspective, our Eduscape model contributes to an identified research gap. That is, to date, the limited research in this area has focused on individual and separate environmental facets. The current research contributes because it is the first study to offer a holistic framework that hypothesises the dynamics between multiple environmental factors and student’s emotions, cognitions and behaviours and simultaneously studies the relationships and therefore assesses the dynamics in play between different variables. The outcome of Study Two also represents a contribution to the literature. Via the empirical assessment of the developed Eduscape model, the current study represents the first to assess simultaneously the relationships of interest.

To summarise, the two studies highlight key ambient factors (comfort, temperature and humidity, design and functionality, audio and visual features) which students report as important and which have a statistically significant effect on the level of pleasure students

report. One factor, cleanliness and upkeep, although determined important by students in Study One does not show statistical significance in Study Two and therefore will require further evaluation to determine the extent of its effects. Other features also highlighted with Study One such as lighting and aroma were not explored within Study Two as scales were not available to test these variables. Future research should attempt to include these factors within the Eduscape framework.

In turn, pleasure is found to have a significant and positive relationship with the three outcome response measures assessed (approach behaviour, satisfaction and engagement/involvement), with the relationship with approach behaviour being the strongest. Overall there is support for the application of an S-O-R approach in educational learning environments and thus a theoretical continuation to work on higher education environments.

This research provides guidance to both lecturers and those members of staff in charge of maintaining, developing, designing and building learning environments. Firstly it is important that students have the chance to say how they feel about their learning environment and that within existing learning environments the optimum levels of temperature, humidity and lighting are determined for each individual learning environment and group of students. Focusing on newly developed learning environments, it is important to determine, alongside students wishes, comfort and design of environments and in particular leg room and desk space. Another issue that should be noted is that staff training is also of vital importance. Many aspects of the learning environment are controllable in many situations (e.g. lighting) and control is often welcomed by those within the environment (Moore and Carter 2002). A number of features could be used in future designs (heating and humidity) and it is important therefore that adequate training is given to staff expected to use these systems. This may also play a role in ensuring that students can hear and see and

whether staff training is a significant issue would need to be tackled and evaluated in future research.

### ***Future Research***

Further research could focus on a number of key areas. Study Two is limited by the study of pleasure only and therefore future studies should also test the effect of environmental factors on both arousal and dominance. The impact on Eduscape staff members would also make an interesting area of enquiry as Kuntz (2011) and Temple (2007) suggest that the physical environment affects staff more than students, a factor reflected in the servicescape model with its emphasis on staff as well as consumers (Bitner 1992). Further research should also study the difference between different lecture theatres and other learning environments that students frequently use and could also respond to calls for an understanding of effective blends of classroom and on-line education as technology is increasingly being used to deliver some portions of our educational content (Arbaugh 2008). Bitner's (1992) typology of services organisations may be a useful classification for learning environments to be studied where classifications can be made by the complexity of the Eduscape (lean or elaborate) and who is performing the actions (self or interpersonal service).

To conclude, the two studies reported above contribute to the literature by synthesising the extant literature in both education and consumption environments and application of this to higher education learning environments. In addition with the results of Study One the paper builds a model, named Eduscape utilising expertise from consumption environment research. The final contribution of the paper is the successful testing of this model deepening understanding of the key factors in higher education learning environments and student's behaviour within them.

This research also contributes by its potential synthesis with other pedagogical

research. While a range of research highlights the importance of materials and curriculum for students without an effective learning environment this work will never make it to the student. Like all services, it is the 'moments of truth' (Beaujean et al 2006): 'when the customer interacts with the organization and the service is produced and consumed' (Bitner 1995, 248) that makes the difference to consumers and it is within the Eduscape, that these moments happen. Some of the necessary changes and adjustments are within the control of the individual academic and where this is the case the academics' should be empowered to easily make the Eduscape as appropriate as possible. Where these adjustments and in some cases structural changes are not within the power of the individual universities need to support and develop solutions alongside both staff and students to ensure that teaching is not undermined by the environments in which they happen and this work contributes to knowledge regarding this element.

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## **Appendix A: Survey Statements for Study One**

### **Physical Quality of the Learning Environment**

The room is a comfortable temperature

The room is sufficiently ventilated and there air is of good quality

The room is crowded

The room is adequately lit

I would prefer to have more natural light in this room

I can clearly hear the lecturer

The visual equipment (projectors etc.) is sufficient

The visual equipment (projectors etc.) is in good working order

The room is clean and well looked after

The room is a comfortable humidity

The room is easily accessible for all students

The room could be evacuated easily if an emergency arose

### **Your Overall Impression of the Learning Environment**

The room is comfortable

I feel at ease in this room

The room gives the impression of a cutting-edge, professional organisation.

I would like more of my lectures to take place in this room

Overall, this room is a positive place to be

Overall, I like this room

### **Learning in this Environment**

The room and environment is conducive to my learning

This room is a pleasurable place in which to learn

The room helps to make a stimulating environment

The room helps my concentration/allows me to concentrate fully on my work



## **Appendix B: Construct and measurement items for Study Two**

### **Comfort<sup>a</sup>**

- CF1 The seating/ desks are comfortable. (.67)<sup>b</sup>
- CF2 The lecture theatre is big enough to contain all of the students comfortably. (.62)<sup>b</sup>

### **Temperature and Humidity<sup>a</sup>**

- TH1 The room is a comfortable humidity. (.67)<sup>b</sup>
- TH2 The lecture theatre is a comfortable temperature. (.75)<sup>b</sup>

### **Design and Functionality<sup>a</sup>**

- DF1 The lecture theatre is well designed. (.68)<sup>b</sup>
- DF2 The lecture theatre's interior is appealing. (.72)<sup>b</sup>
- DF3 The lecture theatre's interior is decorated in an appealing fashion. (.70)<sup>b</sup>
- DF4 The lecture theatre is not attractive. (reverse scored). (.69)<sup>b</sup>

### **Audio and Visual Features<sup>a</sup>**

- AV1 The visual equipment (projectors etc.) are in good working order (.60)<sup>b</sup>
- AV2 The visual equipment (projectors etc.) are sufficient. (.61)<sup>b</sup>

### **Cleanliness<sup>a</sup>**

- CL1 The lecture theatre is not kept clean (reverse scored) (.72)<sup>b</sup>
- CL2 The lecture theatre is kept clean. (.88)<sup>b</sup>
- CL3 The lecture theatre is well looked after. (.65)<sup>b</sup>

### **Pleasure<sup>c</sup>**

- DF1 Happy - Unhappy. (.62)<sup>b</sup>
- DF2 Pleased - Annoyed. (.62)<sup>b</sup>
- DF3 Satisfied - Unsatisfied. (.73)<sup>b</sup>
- DF4 Relaxed - Bored. (reverse scored). (.60)<sup>b</sup>

### **Approach<sup>a</sup>**

- AP1 I enjoy being taught in this room. (.73)<sup>b</sup>
- AP2 I would like for more of my lectures to be in this room. (.64)<sup>b</sup>
- AP3 I dislike working in this room. (reverse scored) (.67)<sup>b</sup>
- AP4 I would like for less of my lecture to be in this room (reverse scored). (.60)<sup>b</sup>
- AP5 This room is a good place to work. (.65)<sup>b</sup>

### **Satisfaction<sup>a</sup>**

- SF1 Overall I am very satisfied with (institution name). (.82)<sup>b</sup>
- SF2 (institution name) is very close to my ideal higher education institution. (.67)<sup>b</sup>
- SF3 (institution name) compared very positively with my expectations. (.79)<sup>b</sup>
- SF4 I would recommend (institution name) to friends and acquaintances. (.83)<sup>b</sup>

### **Engagement/Involvement<sup>c</sup>**

- EI1 Boring-Interesting. (.65)<sup>b</sup>
- EI2 Irrelevant-Relevant. (.68)<sup>b</sup>
- EI3 Unexciting - Exciting(.66)<sup>b</sup>
- EI4 Means a lot to me – Means nothing to me. (.70)<sup>b</sup>

EI5	Appealing-unappealing. (.72) <sup>b</sup>
EI6	Fascinating-mundane.. (.72) <sup>b</sup>
EI7	Valuable-worthless. (.74) <sup>b</sup>
EI8	Needed-not needed. (.67) <sup>b</sup>

<sup>a</sup> Seven-point scale (1 = *strongly disagree*, and 7 = *strongly agree*).

<sup>b</sup> Standardized factor loadings in parenthesis

<sup>c</sup> Bi-polar scale

**Table 1:** Teaching rooms: Study One

<i><b>Room</b></i>	<i><b>Description</b></i>	<i><b>Relevant Students</b></i>
Lecture Theatre One	Modern lecture theater. Tiered, Fixed Seating. 460 capacity. Pool Room: used by all departments	MBA Students Year One Undergraduate Marketing Students
Lecture Theatre Two	Older lecture theater in need of refurbishment. Tiered, Fixed Seating 260 capacity. Pool Room: used by all departments	MBA students
Lecture Theatre Three	Older lecture theater in need of refurbishment. Tiered, Fixed Seating 309 capacity. Pool Room: used by all departments	Year One Undergraduate Marketing Students
Lecture Theatre Four	Older lecture theater in need of refurbishment. Tiered, Fixed Seating, 197 capacity.	Second Year Business Management Undergraduate Students

**Table 2:** Teaching rooms: Study Two

<i><b>Room</b></i>	<i><b>Description</b></i>	<i><b>Relevant Students</b></i>
Lecture Theatre One	Modern lecture theater. Tiered, Fixed Seating. 460 capacity. Pool Room: used by all departments	Year One Undergraduate Marketing Students
Lecture Theatre Two	Flexible learning classroom that holds up to 60 people	MBA students

**Table 3:** Structural model results

Hypothesized paths	Research model	
	$\beta$ (SE)	<i>t</i> -value
H1: Comfort → Pleasure	.35	(2.50)
H2: Temperature and Humidity→ Pleasure	.20	(2.01)
H3: Design and Functionality → Pleasure	.19	(2.12)
H4: Audio and Visual Features → Pleasure	.23	(2.93)
H5: Cleanliness and Upkeep → Pleasure	.11	(1.31)
H6: Pleasure → Approach	.64	(6.45)
H7: Pleasure → Satisfaction	.53	(5.47)
H8: Pleasure → Student Engagement/Involvement	.45	(4.25)
<b>Goodness-of-Fit Statistics</b>		
$\chi^2$	1060.70	
d.f.	519	
$\chi^2$ /d.f.	2.0	
CFI	.93	
NNFI	.93	
RMSEA	.06	

**Figure One: Eduscape Research Model**

